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Core Network and Interoperability Testing (INT);
Diameter Conformance testing for Cx and Dx interfaces;
(3GPP™ Release 10);
Part 2: Test Suite Structure (TSS) and Test Purposes (TP)

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Core Network and Interoperability Testing (INT).

The present document is part 2 of a multi-part deliverable covering the test specifications for the Diameter protocol on the Cx and Dx interfaces, as identified below:

Part 1: "Protocol Implementation Conformance Statement (PICS)";

Part 2: "Test Suite Structure (TSS) and Test Purposes (TP)";

Part 3: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) pro forma specification".

Modal verbs terminology

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1 Scope

The present document provides the Test Suite Structure (TSS) and Test Purposes (TP) for the test specifications for the Diameter protocol on the Cx and Dx interfaces as specified in ETSI TS 129 228 [1] and ETSI TS 129 229 [2] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [5] and ETSI ETS 300 406 [6].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 129 228 (V10.8.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents (3GPP TS 29.228 version 10.8.0 Release 10)".

[2] ETSI TS 129 229 (V10.5.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Cx and Dx interfaces based on the Diameter protocol; Protocol details (3GPP TS 29.229 version 10.5.0 Release 10)".

[3] ETSI TS 103 289-1: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for Cx and Dx interfaces; (3GPP Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

[4] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[5] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[6] ETSI ETS 300 406: "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[7] IETF RFC 3588: "Diameter Base Protocol".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] IETF RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".

[i.2] ETSI TS 133 203: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; 3G security; Access security for IP-based services (3GPP TS 33.203)".

[i.3] IETF RFC 4005: "Diameter Network Access Server Application".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI TS 129 228 [1], ETSI TS 129 229 [2] and the following apply:

Abstract Test Method (ATM): Refer to ISO/IEC 9646-1 [4].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [4].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [4].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [4].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 129 228 [1], ETSI TS 129 229 [2] and the following apply:

TP	Test Purpose
TSS	Test Suite Structure

4 Test configurations

4.1 Introduction

Test purposes of the present document address the IMS functional entities that are accessible via the following standardized DIAMETER interfaces: Cx and Dx and SIP interfaces: Gm.

This clause introduces the test configurations that have been used for the definition of test purposes. Depending on the specific configuration the test system (TS) simulates the behaviour of one or more CSCFs, HSS or SLF communicating with the system under test (SUT).

NOTE: In a real operating network the different Diameter nodes would not connect directly to each other. The connection is usually proxied through one or more Diameter Agents. In the following test architecture figures the Diameter Agent is not explicitly depicted as it is seen as a transparent message handler for conformance testing purposes.

4.2 Test configurations using Cx interface

The Cx interface is located between a CSCF and the HSS.

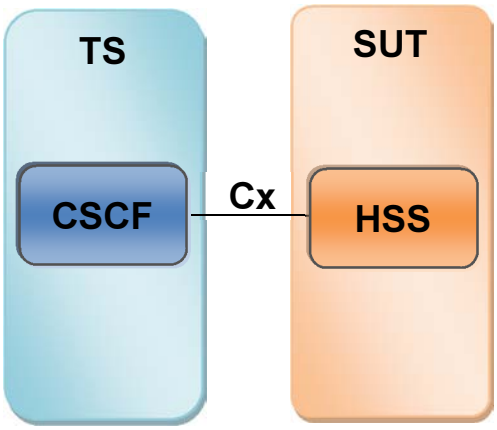

Figure 1: Test configuration CF_1Cx

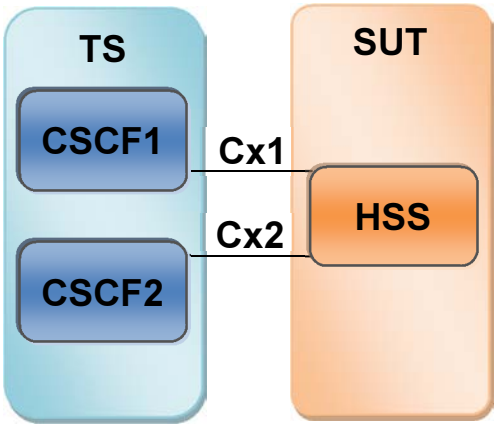

Figure 2: Test configuration CF_2Cx

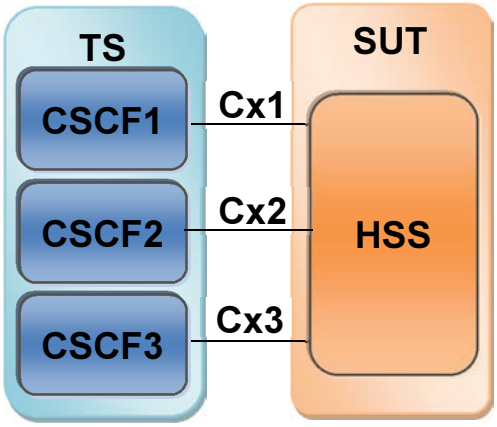

Figure 3: Test configuration CF_3Cx

NOTE 1: Within figure 3 CSCF represents one I-CSCF and two S-CSCF components. Cx interface(DIAMETER protocol) is located between an HSS and I-CSCF or between an HSS and S-CSCF.

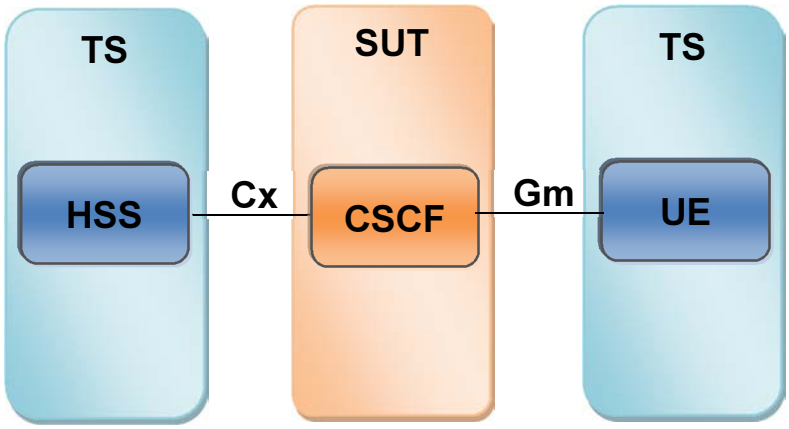

Figure 4: Test configuration CF_1Cx1Gm

NOTE 2: Within figure 4 CSCF represents P-CSCF, I-CSCF and S-CSCF components. Gm interface(SIP protocol) is located between a UE and P-CSCF. Cx interface(DIAMETER protocol) is located between an HSS and I-CSCF or between an HSS and S-CSCF.

4.3 Test configurations using the Dx interface

The Dx interface is located between a CSCF and the SLF.

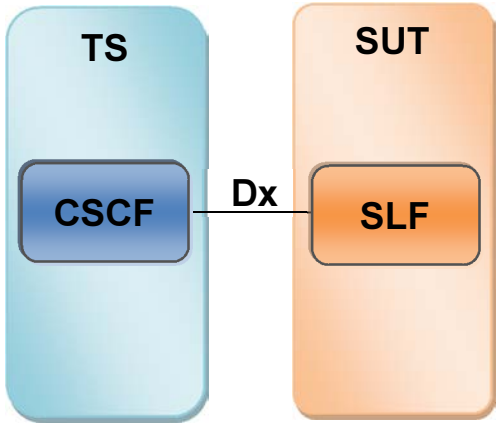

Figure 5: Test configuration CF_1Dx

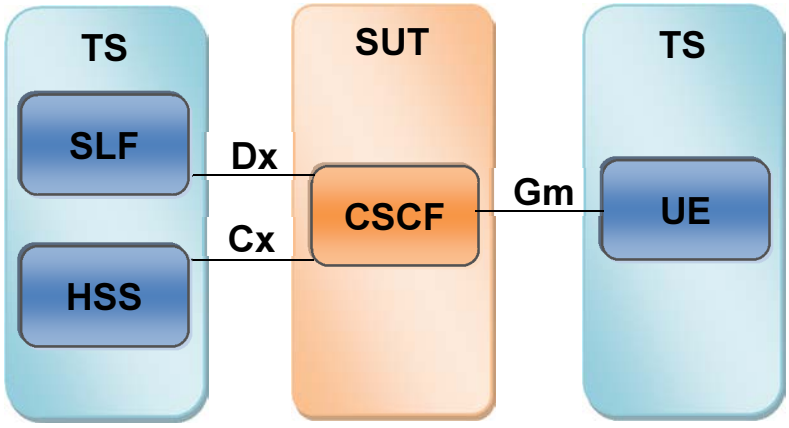

Figure 6: Test configuration CF_1Dx1Cx1Gm

NOTE: Within figure 5 CSCF represents P-CSCF, I-CSCF and S-CSCF components. Gm interface(SIP protocol) is located between a UE and P-CSCF. Cx interface(DIAMETER protocol) is located between an HSS and I-CSCF or between an HSS and S-CSCF. Dx interface(DIAMETER protocol) is located between an SLF and I-CSCF or between an SLF and S-CSCF.

5 Test Suite Structure (TSS) and Test Purposes (TP)

5.1 Test Suite Structure

5.1.1 TP naming convention

TPs are numbered, starting at 001, within each group. Groups are organized according to the TSS.

Table 1: TP identifier naming convention scheme

Identifier: **<TP>_<interface>_<iut>_<scope>_<nn>**				
<tp>	=	Test Purpose:	fixed to "TP"	
<Interface>	=	Interface:	CX or DX	
<iut>	=	type of IUT:	HSS, SLF or CSCF	
<scope>	=	group	MS	Message syntax
			UA	User Authorization commands
			SA	Server Assignment commands
			RT	Registration Termination commands
			LI	Location Information commands
			PP	Push Profile commands
			MA	Multimedia authentication commands
			ER	Error Handling
<nn>	=	sequential number	(01 to 99)	

5.1.2 Test strategy

As the base standards ETSI TS 129 228 [1] and ETSI TS 129 229 [2] contain no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the PICS specification ETSI TS 103 289-1 [3].

5.1.3 TP structure

Each TP has been written in a manner which is consistent with all other TPs. The intention of this is to make the TPs more readable and checkable. A particular structure has been used which is illustrated in table 2. This table should be read in conjunction with any TP, i.e. please use a TP as an example to facilitate the full comprehension of table 2.

Table 2: Structure of a single TP

TP part	Text	Example
Header	**<Identifier>** **<clause number in base ETSI TS 129 228 [1] >** **<PICS reference>**	see table 1 **clause 5.2.1.1.2 (see note 4)** **A.2/3**
Summary	*Short free text description of the test objective*	Verify that the IUT processes all mandatory AVPs in an UL-Request received due to IP-CAN session establishment.
Initial condition (optional)	*Free text description of the condition that the IUT has reached before the test purpose applies.*	The IUT has received AF provisions information about the AF signalling flows between UE and AF.
Configuration (optional)	*Short name of test configuration related to the clause 4 of the present document*	CF_1Cx1Gm
Start point **Stimulus**	Ensure that the IUT in the <state> *see IETF RFC 3588 [7], clause 5.6* *and/or further actions before e stimulus* *if the action is sending/receiving* *see below for message structure* <**trigger**>, *see below for message structure* *or* <goal>	 Open state having sent an AA-Request on receipt of a Capabilities-Exchange-Request (see note 2) to require PCC supervision, etc.
Reaction	<**action**>. *if the action is sending* *see below for message structure* <next action>, *etc.*	sends, saves, does, etc.
Message structure	<message type> *a)* containing a(n) <avp name> AVP *b)* indicating <coding of the field> and *back to a) or b) (see note 3)*	CapabilitieS-Exchange-Answer, etc. (see note 2) Vendor-Id, etc.

NOTE 1: Text in italics will not appear in TPs and text between <> is filled in for each TP and may differ from one TP to the next.

NOTE 2: All messages are considered as "valid and compatible" unless otherwise specified in the test purpose. This includes the presence of all mandatory AVPs as specified in IETF RFC 3588 [7] and in ETSI TS 129 229 [2].

NOTE 3: An AVP can be embedded into another AVP. This is expressed by indentations, e.g. if Message1 contains AVP1 and AVP2 where AVP1 has AVP3 embedded this will be expressed like this:

```
sends/receives Message 1
    containing AVP1
        containing AVP3
            indicating ...
    containing AVP2
        indicating ...
```

NOTE 4: In addition to the clause number there could be specified also following syntaxes:

a) Paragraph symbol ¶ can appear after clause number to make reference more precise. A paragraph consists of one or more sentences and paragraph ends with newline.

b) Syntax like "item X-Y-Z-..." could be also part of reference and it can stand beside clause where X specifies item number and Y and Z are standing to represent number of dashed line. (ex. "item 3-4-1" points to the item 3 and 4th dashed line and 1st dashed line present within previously mentioned 4th dashed line) above syntax can be present within parenthesis or separated with/symbol.

5.2 Test Purposes

5.2.0 PICS references

All PICS items referred to in this clause are as specified in ETSI TS 103 289-1 [3] unless indicated otherwise by another numbered reference. PICS items are only meant for test selection, therefore only PICS items with status optional or conditional are explicitly mentioned.

5.2.1 Cx Interface

5.2.1.1 HSS Role

5.2.1.1.0 Test Selection

IUT takes the role of the HSS; PICS A.2/1 and applicable test configuration is CF_2Cx if not specified differently in the TP.

HSS shall be properly provisioned for all specified tests.

5.2.1.1.1 Message Syntax

TP_CX_HSS_MS_01	**Standards Reference: clause 6 ¶ 2**	**PICS item:**
Summary:	Verify that the IUT sends the appropriate Result-Code AVP when mandatory Visited-Network-Identifier AVP is absent.	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Session-ID AVP containing a Public-Identity AVP indicating the public user identity to be registered **not** containing a Visited-Network-Identifier AVP containing a User-Authorization-Type AVP indicating REGISTRATION containing a User-Name AVP indicating the private user identity containing a Destination-Host AVP containing a Destination-Realm AVP containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_MISSING_AVP containing a Failed AVP indicating missing Visited-Network-Identifier AVP.	
Comments:		

TP_CX_HSS_MS_02	Standards Reference: clause 6 ¶ 2	PICS item:
Summary:	Verify that the IUT sends the appropriate Result-Code AVP when mandatory Public-Identity AVP is absent.	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Session-ID AVP **not** containing a Public-Identity AVP containing a Visited-Network-Identifier AVP indicating the domain name of the visited network containing a User-Authorization-Type AVP indicating REGISTRATION containing a User-Name AVP indicating the private user identity containing a Destination-Host AVP containing a Destination-Realm AVP containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_MISSING_AVP containing a Failed AVP indicating missing Public-Identity AVP.	
Comments:		

5.2.1.1.2 User Authorization

In the test purposes below, an HSS properly provisioned means:

- Some users profile with barred Public User Identity are defined.
- Some users profile with barred Public User Identity and not allowed to roam are defined.
- Some users profile with barred Public User Identity and not allowed to register are defined.
- Some users profile with not barred Public User Identity are defined.

In addition, an Initial registration involves that there is no previously assigned S-CSCF for this user (first registration).

TP_CX_HSS_UA_01	**Standards Reference: clause 6.1.1 and tables 6.1.1.1 and 6.1.1.2 and ETSI TS 129 229 [2], clauses 6.1.1 and 6.1.2**	**PICS item:**
Summary:	Verify that the IUT successfully processes all mandatory AVPs in a UA-Request received due to an UE initial registration.	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating the public user identity to be registered containing a Visited-Network-Identifier AVP indicating the domain name of the visited network containing a User-Authorization-Type AVP indicating REGISTRATION containing a User-Name AVP indicating the private user identity containing a Destination-Host AVP containing a Destination-Realm AVP containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_FIRST_REGISTRATION.	
Comments:	IMS UE Action: Initial registration The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_02	**Standards Reference: clause 6.1.1.1 items 1, 2, 4 (1st dash), 5 (2nd dash), 6 (1st dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when the User-Authorization-Type is absent within UA-Request then the IUT returns the stored S-CSCF name, no S-CSCF capabilities and the appropriate experimental result in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type is absent and Public User Identity is allowed to roam in the visited network and authorized to register - Public User Identity is registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating the public user identity which is already registered containing a User-Name AVP indicating a known private user identity **not** containing a User-Authorization-Type AVP **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_SUBSEQUENT_REGISTRATION containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: Registration (Already Registered - see ETSI TS 129 228 [1], clause A.4.1). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_03	**Standards Reference: clause 6.1.1.1 items 4 (1st dash), 5 (2nd dash), 6 (1st dash), and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when the User-Authorization-Type is equal to REGISTRATION within UA-Request then the IUT returns the stored S-CSCF name, no S-CSCF capabilities and the appropriate experimental result in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type is set to REGISTRATION and Public User Identity is allowed to roam in the visited network and authorized to register - Public User Identity is registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating the public user identity which is already registered containing a User-Name AVP indicating a known private user identity containing a User-Authentication-Type AVP indicating REGISTRATION, **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_SUBSEQUENT_REGISTRATION containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: Registration (Already Registered - see ETSI TS 129 228 [1], clause A.4.1). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_04	**Standards Reference: clauses 6.1.1.1 items 4 (1st dash), 5 (4th dash), 6 (1st dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when the User-Authorization-Type is equal to DE-REGISTRATION within UA-Request then the IUT returns the stored S-CSCF name, no S-CSCF capabilities and the appropriate experimental result in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type set to DE-REGISTRATION - Public User Identity is registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating the public user identity which is already registered containing a User-Name AVP indicating a known private user identity containing a User-Authentication-Type AVP indicating DE-REGISTRATION, **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: Registration (Already Registered - see ETSI TS 129 228 [1], clause A.4.1). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_05	**Standards Reference: clause 6.1.1.1 items4 (1st dash), 5 (3rd dash), 6 (9th dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when IMS-Emergency Registration is set and User-Authorization-Type is absent within UA-Request then the IUT does not return any S-CSCF name but does return an experimental result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is barred and it is an IMS Emergency Registration - User-Authorization-Type is absent - Public User Identity is not registered yet	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating the public user identity to be registered containing a User-Name AVP indicating the associated private user identity containing a UAR-Flags AVP with IMS-Emergency-Registration bit set **not** containing a User-Authorization-Type AVP **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_FIRST_REGISTRATION **not** containing a Server-Name AVP.	
Comments:	IMS UE Action: Initial Registration. The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_06	**Standards Reference: clause 6.1.1.1 items 4 (1st dash), 5 (2nd dash), 6 (1st dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when IMS-Emergency Registration is set and User-Authorization-Type is equal to REGISTRATION within UA-Request then the IUT does not return any S-CSCF name but does return an experimental result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type is set to REGISTRATION and Public User Identity is allowed to roam in the visited network and authorized to register - Public User Identity is registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating a non barred public user identity containing a User-Name AVP indicating the associated private user identity containing a User-Authentication-Type AVP indicating REGISTRATION containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_SUBSEQUENT_REGISTRATION containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: Registration (Already registered - see ETSI TS 129 228 [1], clause A.4.1). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_07	**Standards Reference: clause 6.1.1.1 items 4 (3rd dash), 5 (2nd dash), 6 (1st dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT checks whether the Public User Identity received in a subsequent UA-Request is barred from the establishment of multimedia sessions. - On receipt of UA-Request with other non barred Public User Identity and IMS-Emergency Registration is not set and User-Authorization-Type is equal to REGISTRATION or is absent then the IUT returns the S-CSCF name, no S-CSCF capabilities and an appropriate experimental result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred and within IUT there are other non-barred Public User Identities to be implicitly registered - User-Authorization-Type is absent and Public User Identity is allowed to roam in the visited network and authorized to register - Public User Identity is registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating a non barred public user identity containing a User-Name AVP indicating the associated private user identity containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_SUBSEQUENT_REGISTRATION containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: Registration (Already registered - see ETSI TS 129 228 [1], clause A.4.1). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_08	Standards Reference: clause 6.1.1.1 items 4 (1st dash), 5 (7th dash) and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT when IMS-Emergency Registration is set and if User-Authorization-Type is equal to REGISTRATION_AND_CAPABILITIES within UA-Request then the IUT does not return any S-CSCF name and does return the appropriate result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is barred and it is an IMS Emergency Registration - User-Authorization-Type is REGISTRATION_AND_CAPABILITIES - Public User Identity is registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating a public user identity containing a User-Name AVP indicating the associated private user identity containing a User-Authentication-Type AVP indicating REGISTRATION_AND_CAPABILITIES containing a UAR-Flags AVP with IMS-Emergency-Registration bit set **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing a Server-Name AVP.	
Comments:	IMS UE Action: Registration (Already registered - see ETSI TS 129 228 [1], clause A.4.1). The I-CSCF requests for S-CSCF capabilities.	

TP_CX_HSS_UA_09	Standards Reference: clause 6.1.1.1 item 5 (6th dash) and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT checks the User-Authorization-Type received in the UA-Request if IMS-Emergency Registration is not set and User-Authorization-Type is equal to REGISTRATION_AND_CAPABILITIES then the IUT does not return S-CSCF name and does return the appropriate result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is barred and it is an IMS Emergency Registration - User-Authorization-Type is REGISTRATION_AND_CAPABILITIES and Public User Identity is allowed to roam in the visited network and authorized to register - Public User Identity is registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating public user identity containing a User-Name AVP indicating the associated private user identity containing a User-Authentication-Type AVP indicating REGISTRATION_AND_CAPABILITIES containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing a Server-Name AVP.	
Comments:	IMS UE Action: Registration (Already registered - see ETSI TS 129 228 [1], clause A.4.1). The I-CSCF requests for S-CSCF capabilities.	

TP_CX_HSS_UA_10	**Standards Reference: clause 6.1.1.1 items 1, 2, 4 (1st dash), 5 (4th dash), 6 (1st dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when the User-Authorization-Type is equal to DE-REGISTRATION within UA-Request then the IUT returns the stored S-CSCF name, no S-CSCF capabilities and the appropriate result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is barred and it is an IMS Emergency Registration - User-Authorization-Type set to DE-REGISTRATION - Public User Identity is registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating non-barred public user identity allow to roam indicating the public user identity which is already registered containing a User-Name AVP indicating a known private user identity containing a User-Authentication-Type AVP indicating DE-REGISTRATION containing a UAR-Flags AVP with IMS-Emergency-Registration bit set, **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: De-Registration (Already Registered Public User- see ETSI TS 129 228 [1], clauses A.4.1 and A.4.3). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_11	**Standards Reference: clause 6.1.1.1 items 1, 2, 4 (1st dash), 5 (4th dash), 6 (2nd dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when receives UA-Request where the Public User Identity is unregistered and the User-Authorization-Type is equal to DE-REGISTRATION then the IUT returns the stored S-CSCF name, no S-CSCF capabilities and the appropriate result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type set to DE-REGISTRATION - Public User Identity is un-registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating non-barred public user identity allow to roam indicating the public user identity which is unregistered containing a User-Name AVP indicating a known private user identity containing a User-Authentication-Type AVP indicating DE-REGISTRATION, **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: De-Registration (Un-Registered Public User- see ETSI TS 129 228 [1], clause A.4.3). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_12	**Standards Reference: clause 6.1.1.1 items 1, 2, 4 (1st dash), 5 (2nd dash), 6 (2nd dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when receives UA-Request where the Public User Identity is unregistered and the User-Authorization-Type is equal to REGISTRATION then the IUT returns the stored S-CSCF name, no S-CSCF capabilities and the appropriate experimental result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type is set to REGISTRATION and Public User Identity is allowed to roam in the visited network and authorized to register - Public User Identity is un-registered	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating non-barred public user identity allow to roam indicating the public user identity which is unregistered containing a User-Name AVP indicating a known private user identity containing a User-Authentication-Type AVP indicating REGISTRATION, **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_SUBSEQUENT_REGISTRATION containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: Registration (Un-Registered Public User see ETSI TS 129 228 [1], clause A.4.1). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_13	**Standards Reference: clause 6.1.1.1 items 1, 2, 4 (1st dash), 5 (4th dash), 6 (4th dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when User-Authorization-Type is equal to DE-REGISTRATION within UA-Request then the IUT does not return the S-CSCF name or S-CSCF capabilities and does return the appropriate experimental result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type set to DE-REGISTRATION - Public User Identity is not registered yet.	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating the public user identity which is un-registered containing a User-Name AVP indicating a known private user identity containing a User-Authentication-Type AVP indicating DE-REGISTRATION, **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_IDENTITY_NOT_REGISTERED **not** containing a Server-Name AVP **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: De-Registration (not Registered Public User yet). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_14	**Standards Reference: clause 6.1.1.1 items 1, 2, 4 (1st dash), 5 (4th dash), 6 (4th dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT when User-Authorization-Type is equal to DE-REGISTRATION within UA-Request and authentication procedure is not yet finished the IUT returns the stored S-CSCF name, no S-CSCF capabilities and the appropriate result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type set to DE-REGISTRATION - Public User Identity is not registered yet (first registration is done but not second registration with authentication information)	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating non-barred public user identity allow to roam indicating the public user identity which is already registered containing a User-Name AVP indicating a known private user identity containing a User-Authentication-Type AVP indicating DE-REGISTRATION, **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: De-Registration (not Registered Public User yet - only first REGISTER without Authentication information is sent from UE). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_15	Standards Reference: clause 6.1.1.1 items 4 (1st dash), 5 (2nd dash), 6 (6th dash) and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT when IMS-Emergency Registration is not set and User-Authorization-Type is equal to REGISTRATION or is absent within UA-Request the IUT returns S-CSCF name, no S-CSCF capabilities and the appropriate experimental result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type is set to REGISTRATION and Public User Identity is allowed to roam in the visited network and authorized to register - Public User Identity is not registered yet and if there is at least one Public User Identity within IMS Subscription that is registered	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating a non barred public user identity registered within IMS subscription containing a User-Name AVP indicating the associated private user identity containing a User-Authentication-Type AVP indicating REGISTRATION containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_SUBSEQUENT_REGISTRATION containing a Server-Name AVP indicating the name of the assigned S-CSCF **not** containing a Server-Capabilities AVP.	
Comments:	IMS UE Action: Registration (Not registered yet). The I-CSCF does not request for S-CSCF capabilities.	

TP_CX_HSS_UA_16	Standards Reference: clause 6.1.1.1 item 1 and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT checks that the Private User Identity and the Public User Identity exists in the HSS and if not then IUT sets the appropriate experimental result code in the UA-Answer.	
Initial condition:	- Private User Identity does not exist and Public User Identity exists in IUT	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a User-Name AVP indicating an unknown private user identity containing a Public-Identity AVP indicating a known public user identity, **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_USER_UNKNOWN **not** containing a Server-Name AVP.	
Comments:	IMS UE Action: Registration (Not registered yet).	

TP_CX_HSS_UA_17	Standards Reference: clause 6.1.1.1 item 2 and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT checks that the Private User Identity matches a distinct Public User Identity in the HSS and if not then IUT sets the appropriate experimental result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity does not match a distinct Public User Identity in IUT	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Public-Identity AVP indicating a known public user identity containing a User-Name AVP indicating an unknown private user identity, **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_USER_UNKNOWN **not** containing a Server-Name AVP.	
Comments:	IMS UE Action: Registration (Not registered yet).	

TP_CX_HSS_UA_18	Standards Reference: clause 6.1.1.1 item 3 and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT checks that the Public User Identity received in the request is associated with the Private User Identity received in the request and if not the IUT sets the appropriate experimental result code in the UA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is not associated to Private User Identity in IUT	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a User-Name AVP indicating an unassociated private user identity (not belonging to the public user identity) containing a Public-Identity AVP indicating a known public user identity **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_IDENTITIES_DONT_MATCH **not** containing a Server-Name AVP.	
Comments:	IMS UE Action: Registration (Not registered yet).	

TP_CX_HSS_UA_19	Standards Reference: clause 6.1.1.1 item 4 (4th dash) and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT checks whether there are other non-barred Public User Identities to be implicitly registered with that one and if not then IUT sets the appropriate result code within response.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - other non-barred Public User Identities implicitly registered are not present	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating no other non-barred public user identity **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_AUTHORIZATION_REJECTED **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration (Not registered yet).	

TP_CX_HSS_UA_20	Standards Reference: clause 6.1.1.1 item 5 (2nd dash) and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT sets the appropriate experimental result code in the UA-Answer when the Public User Identity is not barred and not allowed to roam in the visited network, User-Authorization-Type AVP is set to REGISTRATION and if it is not an IMS Emergency Registration.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type is set to REGISTRATION and Public User Identity is not allowed to roam in the visited network	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating not barred public user identity containing a User-Authentication-Type AVP indicating REGISTRATION containing a Visited-Network-Identifier AVP indicating the domain not allowed to roam containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_ROAMING_NOT_ALLOWED.	
Comments:	IMS UE Action: Registration (Not registered yet).	

TP_CX_HSS_UA_21	Standards Reference: clause 6.1.1.1 item 5 (2nd dash) and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT sets the appropriate result code in the UA-Answer when Public User Identity is not barred and not allowed to register, User-Authorization-Type AVP is set to REGISTRATION and if it is not an IMS Emergency Registration.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type is set to REGISTRATION and Public User Identity is allowed to roam in the visited network and not authorized to register	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating non-barred public user identity not allow to register containing a User-Authentication-Type AVP indicating REGISTRATION containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_AUTHORIZATION_REJECTED **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration (Not registered yet).	

TP_CX_HSS_UA_22	Standards Reference: clause 6.1.1.1 item 5 (2nd dash) and tables 6.1.1.1 and 6.1.1.2	PICS item:
Summary:	Verify that the IUT sets the appropriate experimental result code in the UA-Answer when Public User Identity is not barred and not allowed to roam in the visited network, User-Authorization-Type AVP is absent and if it is not an IMS Emergency Registration.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type is absent and Public User Identity is not allowed to roam in the visited network and it is authorized to register	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating non-barred public user identity **not** containing a User-Authentication-Type AVP containing a Visited-Network-Identifier AVP indicating the domain not allowed to roam containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_ROAMING_NOT_ALLOWED.	
Comments:	IMS UE Action: Registration (Not registered yet).	

TP_CX_HSS_UA_23	**Standards Reference: clause 6.1.1.1 item 5 (2nd dash) and tables 6.1.1.1 and 6.1.1.2**	**PICS item:**
Summary:	Verify that the IUT sets the appropriate result code in the UA-Answer when Public User Identity is not barred and not allowed to register, User-Authorization-Type AVP is absent and if it is not an IMS Emergency Registration.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Public User Identity received in Request is not barred - User-Authorization-Type is absent and Public User Identity is allowed to roam in the visited network and not authorized to register	
Configuration:	CF_1Cx	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating non-barred public user identity not allow to register **not** containing a User-Authentication-Type AVP containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set **sends a UA-Answer** containing a Result-Code AVP indicating DIAMETER_AUTHORIZATION_REJECTED **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration (Not registered yet).	

5.2.1.1.3 Server assignment

TP_CX_HSS_SA_01	Standards Reference: clause 6.1.2 and tables 6.1.2.1 and 6.1.2.2 and ETSI TS 129 229 [2], clauses 6.1.3 and 6.1.4	PICS item:
Summary:	Verify that the IUT successfully processes all mandatory AVPs in an SA-Request received due to S-CSCF registration notification procedure.	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating one and only one public user identity **not** containing a User-Name AVP containing a Destination-Realm AVP containing a Server-Name AVP indicating S-CSCF name containing a Server-Assignment-Type AVP indicating UNREGISTERED_USER containing a User-Data-Already-Available AVP **sends an SA-Answer** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a User-Data AVP containing a Charging-Information AVP.	
Comments:		

TP_CX_HSS_SA_02	Standards Reference: clause 6.1.2.1 item 1 and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks that the Private Identity and the Public Identity exists in the HSS and if not the IUT sets the appropriate experimental result code in the response.	
Initial condition:	- Private Identity does not exist and Public Identity exists in IUT	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating an unknown private user identity containing a Public-Identity AVP indicating a known public user identity, **sends an SA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_USER_UNKNOWN.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_03	Standards Reference: clause 6.1.2.1 item 2 and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks that the Public Identity received in the request is associated with the Private Identity received in the request and if not the IUT sets appropriate experimental result code in the response.	
Initial condition:	- Private and Public Identity exist in IUT - Public Identity received in Request is not associated to Privat identitiy in IUT	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating an unassociated private user identity (not belonging to the public user identity) containing a Public-Identity AVP indicating a known public user identity **sends an SA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_IDENTITIES_DONT_MATCH.	
Comments:	IMS UE Action: Registration- see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_04	Standards Reference: clause 6.1.2.1, item 3 and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks in received SA-Request if more than one Public-Identity AVPs are present and if the Server-Assignment-Type AVP value is one from the table 3 then IUT sets the appropriate result code in the SA-Answer.	
Initial condition:	- Private and Public Identity exists in IUT - Public Identity received in Request is associated to Private Identity in IUT	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing **more than one** Public-Identity AVP indicating a user identity containing a Server-Assignment-Type AVP indicating variant value from table 3 **sends an SA-Answer** containing a Result-Code AVP indicating DIAMETER_AVP_OCCURS_TOO_MANY_TIMES **not** containing an Experimental-Result AVP **not** containing a User-Name AVP **not** containing a User-Data AVP.	
Comments:	IMS UE Action: Registration- see ETSI TS 129 228 [1], clause A.4.1.	

Table 3: Server-Assignment-Type AVP values for more than one Public-Identity AVPs

Test purpose variants	Server-Assignment-Type AVP values
VA_01	NO_ASSIGNMENT (0)
VA_02	REGISTRATION (1)
VA_03	RE_REGISTRATION (2)
VA_04	UNREGISTERED_USER (3)
VA_05	AUTHENTICATION_FAILURE (9)
VA_06	AUTHENTICATION_TIMEOUT (10)
VA_07	AAA_USER_DATA_REQUEST (12)
VA_08	PGW_UPDATE (13)

TP_CX_HSS_SA_05	Standards Reference: clause 6.1.2.1 item 4 (1st dash) and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the identity is not distinct Public-User Identity and if the Server-Assignment-Type AVP value is one from the table 4 the IUT sets the appropriate experimental result code in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is not distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Assignment-Type AVP indicating variant value from table 4 **sends an SA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_IN_ASSIGNMENT_TYPE.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

Table 4 : Server-Assignment-Type AVP values for not distinct Public User Identity

Test purpose variants	Server-Assignment-Type AVP values
VA_01	REGISTRATION (1)
VA_02	RE_REGISTRATION (2)
VA_03	USER_DEREGISTRATION (5)
VA_04	USER_DEREGISTRATION_STORE_SERVER_NAME (7)
VA_05	AUTHENTICATION_FAILURE (9)
VA_06	AUTHENTICATION_TIMEOUT (10)

TP_CX_HSS_SA_06	Standards Reference: clause 6.1.2.1 item 4 (2nd dash) and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the identity is Public-Service Identity and if the PSI Activation State for that identity is not active the IUT sets the appropriate experimental result code in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - PSI Activation State of the Public Service Identity is not active	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing Public-Identity AVP indicating a service identity containing a Server-Assignment-Type AVP indicating variant value from table 3 **sends an SA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_USER_UNKNOWN.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_07	Standards Reference: clause 6.1.2.1 item 5 (1st dash) and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the Server-Assignment-Type AVP value is REGISTRATION or RE_REGISTRATION and if there is already an S-CSCF assigned to the user which not matches with one received in request the IUT sets the appropriate experimental result code in the response.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Name AVP indicating different S-CSCF than already assigned containing a Server-Assignment-Type AVP indicating variant value REGISTRATION or RE_REGISTRATION **sends an SA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_IDENTITY_ALREADY_REGISTERED.	
Comments:	IMS UE Action: Registration- see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_08	Standards Reference: clauses 6.1.2.1 item 5 1st dash and 6.6 ¶ 2 and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the Server-Assignment-Type AVP value is REGISTRATION or RE_REGISTRATION and if the requesting S-CSCF is the same as the previously assigned S-CSCFand if User-Data-Already-Available AVP is set to USER_DATA_NOT_AVAILABLE the IUT sets the appropriate result code and the user profile in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating implicitly registered public user identity containing a Server-Name AVP indicating same S-CSCF than already assigned containing a Server-Assignment-Type AVP indicating variant value REGISTRATION or RE_REGISTRATION containing a User-Data-Already-Available AVP indicating USER_DATA_NOT_AVAILABLE **sends an SA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a User-Data AVP.	
Comments:	IMS UE Action: Registration- see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_09	Standards Reference: clause 6.1.2.1 item 5 (1st dash) and 6.6 ¶ 3 and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the Server-Assignment-Type AVP value is REGISTRATION or RE_REGISTRATION and if the requesting S-CSCF is the same as the previously assigned S-CSCF and if User-Data-Already-Available AVP is set to USER_DATA_ALREADY_AVAILABLE the IUT sets the appropriate result code and may include the user profile in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Name AVP indicating same S-CSCF than already assigned containing a Server-Assignment-Type AVP indicating variant value REGISTRATION or RE_REGISTRATION containing a User-Data-Already-Available AVP indicating USER_DATA_ALREADY_AVAILABLE **sends an SA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration- see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_10	Standards Reference: clause 6.1.2.1 item 5 (2nd dash) and table 6.1.2.2	PICS item: NOT A.3/2
Summary:	Verify that the IUT checks within received SA-Request if the Server-Assignment-Type AVP value is UNREGISTERED_USER and the requesting S-CSCF is not the same as previously assigned and IMS restoration procedures are not supported and sets the appropriate experimental result code and includes the previously assigned S-CSCF in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Name AVP indicating different S-CSCF than already assigned containing a Server-Assignment-Type AVP indicating variant value UNREGISTERED_USER **sends an SA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_IDENTITY_ALREADY_REGISTERED containing a Server-Name AVP indicating previously assigned S-CSCF.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_11	Standards Reference: clause 6.1.2.1 item 5 (2nd dash) and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the Server-Assignment-Type AVP value is UNREGISTERED_USER and the registration state of the Public Identity is not registered the IUT sets the appropriate result code in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Name AVP indicating assigned S-CSCF containing a Server-Assignment-Type AVP indicating variant value UNREGISTERED_USER **sends an SA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_12	Standards Reference: clause 6.1.2.1 item 5 (2nd dash) and table 6.1.2.2	PICS item: NOT A.3/2
Summary:	Verify that the IUT checks within received SA-Request if the Server-Assignment-Type AVP value is UNREGISTERED_USER and the registration state of the Public Identity is registered and IMS restoration procedures are not supported the IUT sets the appropriate result code in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Name AVP indicating assigned S-CSCF containing a Server-Assignment-Type AVP indicating variant value UNREGISTERED_USER **sends an SA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration- see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_13	Standards Reference: clause 6.1.2.1 item 5 (2nd dash) and table 6.1.2.2	PICS item: A.3/2
Summary:	Verify that the IUT checks within received SA-Request if the Server-Assignment-Type AVP value is UNREGISTERED_USER and the registration state of the Public Identity is registered and IMS restoration procedures are supported the IUT sets the appropriate experimental result code and includes an SCSCF-Restoration-Info AVP in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Name AVP indicating assigned S-CSCF containing a Server-Assignment-Type AVP indicating variant value UNREGISTERED_USER **sends an SA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_IN_ASSIGNMENT_TYPE containing an SCSCF-Restoration-Info AVP indicating information related with Public User Identity.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_14	Standards Reference: clause 6.1.2.1 item 5 (3rd dash) and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the identity is distinct Public-User Identity and if the Server-Assignment-Type AVP value is one from the table 5 and sets the appropriate result code in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Assignment-Type AVP indicating variant value from table 5 **sends an SA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

Table 5: Server-Assignment-Type AVP values for TP_CX_HSS_SA_14

Test purpose variants	Server-Assignment-Type AVP values
VA_01	TIMEOUT_DEREGISTRATION (4)
VA_02	USER_DEREGISTRATION (5)
VA_03	ADMINISTRATIVE_DEREGISTRATION (8)
VA_04	DEREGISTRATION_TOO_MUCH_DATA (11)

TP_CX_HSS_SA_15	Standards Reference: clause 6.1.2.1 item 5 (8th dash) and tables 6.1.2.2 and 6.6.2 ¶ 1	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the identity is distinct Public-User Identity and if the Server-Assignment-Type AVP value is one from the table 6 and sets the appropriate result code or experimental result code in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Assignment-Type AVP indicating variant value from table 6 **sends an SA-Answer** (containing a Result-Code AVP indicating DIAMETER_SUCCESS) **or** (containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_SUCCESS_SERVER_NAME_NOT_STORED).	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

Table 6: Server-Assignment-Type AVP values for TP_CX_HSS_SA_15

Test purpose variants	Server-Assignment-Type AVP values
VA_01	TIMEOUT_DEREGISTRATION_STORE_SERVER_NAME (6)
VA_02	USER_DEREGISTRATION_STORE_SERVER_NAME (7)

TP_CX_HSS_SA_16	Standards Reference: clause 6.1.2.1 item 5 (15th dash) and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the identity is distinct Public-User Identity and if the Server-Assignment-Type AVP value is NO_ASSIGNMENT and the requesting S-CSCF is not the same as previously assigned the IUT sets the appropriate result code in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Name AVP indicating different S-CSCF than already assigned containing a Server-Assignment-Type AVP indicating NO_ASSIGNMENT **sends an SA-Answer** containing a Result-Code AVP indicating DIAMETER_UNABLE_TO_COMPLY **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_17	Standards Reference: clause 6.1.2.1 item 5 (15th dash) and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the identity is distinct Public-User Identity and if the Server-Assignment-Type AVP value is NO_ASSIGNMENT and the requesting S-CSCF is the same as previously assigned the IUT sets the appropriate result code in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Name AVP indicating same S-CSCF than already assigned containing a Server-Assignment-Type AVP indicating NO_ASSIGNMENT **sends an SA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_SA_18	Standards Reference: clause 6.1.2.1 item 5 (16th dash) and table 6.1.2.2	PICS item:
Summary:	Verify that the IUT checks within received SA-Request if the identity is distinct Public-User Identity and if the Server-Assignment-Type AVP value is one from the table 7 the IUT sets the appropriate result code in the SA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public Identity received in Request is associated to Private Identity in IUT - Public User Identity received in Request is distinct	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP indicating a user identity containing a Server-Assignment-Type AVP indicating variant value from table 7 **sends an SA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

Table 7: Server-Assignment-Type AVP values for TP_CX_HSS_SA_18

Test purpose variants	Server-Assignment-Type AVP values
VA_01	AUTHENTICATION_FAILURE (9)
VA_02	AUTHENTICATION_TIMEOUT (10)

5.2.1.1.4 Registration Termination

TP_CX_HSS_RT_01	Standards Reference: clause 6.1.3 ¶ 1 and 2 and tables 6.1.3.1 and 6.1.3.2 and ETSI TS 129 229 [2] clauses 6.1.9 and 6.1.10	PICS item:
Summary:	Verify that the IUT successfully processes all mandatory AVPs in an RT-Request sent due to an administrative de-registration.	
Initial condition:	- A user is properly registered	
Test purpose:	Ensure that the IUT **to indicate** an administrative de-registration **sends an RT-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update containing a Destination-Realm AVP containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating the de-registration code.	
Comments:	NOTE: Registration procedure completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

TP_CX_HSS_RT_02	Standards Reference: clause 6.1.3.1 ¶ 1and 2 (1st dash) and tables 6.1.3.1 and 6.1.3.2	PICS item:
Summary:	Verify that the IUT successfully processes an administrative de-registration (one public identity).	
Initial condition:	- A user is properly registered - Registration includes only one public Identity	
Test purpose:	Ensure that the IUT **to indicate** an administrative de-registration **sends an RT-Request** containing a Public-Identity AVP indicating the public user identity containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating any deregistration reason containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update.	
Comments:	NOTE: Registration procedure completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

TP_CX_HSS_RT_03	**Standards Reference: clause 6.1.3.1 ¶ 1 and 2 (1st dash) and tables 6.1.3.1 and 6.1.3.2**	**PICS item: A.3/3.3.1**
Summary:	Verify that the IUT successfully processes an administrative de-registration (several public identities).	
Initial condition:	- A user is properly registered - Registration includes a list of public Identities associated to the user	
Test purpose:	Ensure that the IUT **to indicate** an **administrative de-registration** **sends an RT-Request** containing a list of Public-Identity AVP indicating each public user identity provided during Registration containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating any deregistration reason containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update.	
Comments:	NOTE: Registration procedure completed with several public identities completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

TP_CX_HSS_RT_04	**Standards Reference: clause 6.1.3.1 ¶ 1 and 2 (2nd dash) and tables 6.1.3.1 and 6.3.1.2**	**PICS item:**
Summary:	Verify that the IUT successfully processes an administrative de-registration (no public identity, only one private identity).	
Initial condition:	- A user is properly registered	
Test purpose:	Ensure that the IUT **to indicate** an administrative de-registration **sends an RT-Request** **not** containing a list of Public-Identity AVP containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating PERMANENT_TERMINATION **or** indicating SERVER_CHANGE **or** indicating REMOVE_S-CSCF containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update.	
Comments:	NOTE: Registration procedure completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

TP_CX_HSS_RT_05	Standards Reference: clause 6.1.3.1 ¶ 1 and 2 (2nd dash) and tables 6.1.3.1 and 6.1.3.2	PICS item:
Summary:	Verify that the IUT successfully processes an administrative de-registration (no public identity, several private identities).	
Initial condition:	- A user is properly registered - Registration does not include any public Identity associated to the user	
Test purpose:	Ensure that the IUT **to indicate** an administrative de-registration **sends an RT-Request** **not** containing a list of Public-Identity AVP containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating PERMANENT_TERMINATION **or** indicating SERVER_CHANGE **or** indicating REMOVE_S-CSCF containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update..	
Comments:	NOTE: Registration procedure completed with no public identity and several private identities completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

TP_CX_HSS_RT_06	Standards Reference: clause 6.1.3.1 ¶ 1 and 2 (3rd dash) and tables 6.1.3.1and 6.1.3.2	PICS item:
Summary:	Verify that the IUT successfully processes an administrative de-registration (Public Service Identities).	
Initial condition:	- A user is properly registered - The user establishes a call to a public service	
Test purpose:	Ensure that the IUT **to indicate** an administrative de-registration **sends an RT-Request** containing a Public-Identity AVP indicating a public service identity matching the wildcarded public service identity provided by the SA-Request message containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update.	
Comments:	NOTE: Registration procedure completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

TP_CX_HSS_RT_07	Standards Reference: clause 6.1.3.1 ¶ 1 and 2 (4th dash) and tables 6.1.3.1 and 6.1.3.2	PICS item:
Summary:	Verify that the IUT can successfully processes an administrative de-registration (one wildcarded public user identity).	
Initial condition:	- A user is properly registered with wildcarded public user identity	
Test purpose:	Ensure that the IUT **to indicate** an administrative de-registration **sends an RT-Request** containing a Public-Identity AVP indicating wildcarded public user identity containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update.	
Comments:	NOTE: Registration procedure completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

TP_CX_HSS_RT_08	Standards Reference: clause 6.1.3 ¶ 1 and 2 (6th dash) and tables 6.1.3.1 and 6.1.3.2	PICS item:
Summary:	Verify that the IUT indicates a change of S-CSCF server.	
Initial condition:	- A user initiates a registration	
Configuration:	CF_3Cx	
Test purpose:	Ensure that the IUT **to indicate** change of S-CSCF server **sends an RT-Request** containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating NEW_SERVER_ASSIGNED containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update containing a Public-Identity AVP.	
Comments:	NOTE 1: Two test components of S-CSCFs and one I-CSCF need to be created. NOTE 2: Registration procedure up to the Authentication Vector Selection to be initiated before Test purpose check - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

TP_CX_HSS_RT_09	Standards Reference: clause 6.1.3 ¶ 1 and 2 (7th dash) and tables 6.1.3.1 and 6.1.3./2	PICS item:
Summary:	Verify that the IUT indicates a change of S-CSCF server.	
Initial condition:	- A user is properly registered	
Configuration:	CF_3Cx	
Test purpose:	Ensure that the IUT **to indicate** a change of an S-CSCF **sends an RT-Request** containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating SERVER_CHANGE containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update.	
Comments:	NOTE 1: Registration procedure completed. NOTE 2: At least two S-CSCFs need to be configured and request need to be triggered to force the selection of the new S-CSCF - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

TP_CX_HSS_RT_10	Standards Reference: clause 6.1.3 ¶ 1 and 2 (8th dash) and tables 6.1.3.1and 6.1.3.2	PICS item:
Summary:	Verify that the IUT indicates removing of a S-CSCF server.	
Initial condition:	- A user is properly registered	
Test purpose:	Ensure that the IUT **to indicate** removal of an S-CSCF **sends an RT-Request** containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating REMOVE_S-CSCF containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update.	
Comments:	NOTE: Registration procedure completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.4.2.	

5.2.1.1.5 Location Information

TP_CX_HSS_LI_01	Standards Reference: clause 6.1.4 ¶ 1 and tables 6.1.4.1 and 6.1.4.2 and ETSI TS 129 229 [2] clauses 6.1.5 and 6.1.6	PICS item:
Summary:	Verify that the IUT processes are all mandatory AVPs in an LI-Request received from I-CSCF.	
Initial condition:	- A user initiates an INVITE	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Public-Identity AVP **sends an LI-Answer** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS.	
Comments:	IMS UE Action: Initiate an INVITE- see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

TP_CX_HSS_LI_02	Standards Reference: clause 6.1.4.1 item 1 and tables 6.1.4.1 and 6.1.4.2	PICS item:
Summary:	Verify that the IUT processes a LI-Request received containing an unknown public identity.	
Initial condition:	- A user initiates an INVITE with an unknown public identity	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Public-Identity AVP indicating an unknown public identity **sends an LI-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_USER_UNKNOWN.	
Comments:	IMS UE Action: Initiate an INVITE with an unknown public identity- see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

TP_CX_HSS_LI_03	Standards Reference: clause 6.1.4.1 item 2a (1st dash) and tables 6.1.4.1 and 6.1.4.2	PICS item: A3/3.4.2
Summary:	Verify that the IUT checks after reception of LI-Request if Public Identity state is set as registered and User-Authorization-Type is set to RGISTRATION_AND_CAPABILITIES the IUT sets the appropriate result code in the LI-Answer.	
Initial condition:	- Public User Identity is known - IMS Restoration procedures are supported	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Public-Identity AVP indicating a known public identity containing a User-Authorization-Type AVP indicating REGISTRATION_AND_CAPABILITIES **sends an LI-Answer** **not** containing a Server-Name AVP (containing a Server-Capabilities AVP indicating Mandatory-Capability AVPs indicating zero or more Optional-Capability AVP indicating zero or more Server-Name AVP) **or** (not containing a Server-Capabilities AVP) **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS.	
Comments:	NOTE 1: Preamble action: Registration procedure over Cx interface. NOTE 2: An I-CSCF and S-CSCF test components need to be configured - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

TP_CX_HSS_LI_04	Standards Reference: clause 6.1.4.1 item 2 (1st dash) and tables 6.1.4.1 and 6.1.4.2	PICS item:
Summary:	Verify that the IUT checks after reception of an LI-Request if there is an inactive public service identity and then IUT sets the appropriate experimental result code in the LI-Answer.	
Initial condition:	- Public Server Identity is inactive	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing Originating-Request AVP indicating an AS originating SIP request containing a Public-Identity AVP indicating an inactive public service identity **sends an LI-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_USER_UNKNOWN.	
Comments:	NOTE: An I-CSCF and S-CSCF test components need to be configured - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

TP_CX_HSS_LI_05	Standards Reference: clause 6.1.4.1 item 2 (2nd dash) and tables 6.1.4.1 and 6.1.4.2	PICS item:
Summary:	Verify that the IUT checks after reception of an LI-Request if there is public service identity and the IUT sets the appropriate result code in the LI-Answer.	
Initial condition:	- Public Server Identity is known	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** **not** containing Originating-Request AVP containing a Public-Identity AVP indicating public service identity **sends an LI-Answer** containing a Server-Name AVP indicating the AS name containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	NOTE: An I-CSCF and S-CSCF test components need to be configured - see ETSI TS 129 228 [1] A.4.1 and A.4.5.	

TP_CX_HSS_LI_06	Standards Reference: clause 6.1.4.1 item3 (1st dash) and tables 6.1.4.1 and 6.1.4. and 6.1.4/2	PICS item: NOT A.3/2
Summary:	Verify that the IUT checks after reception of LI-Request if Public Identity state is set as registered and the IUT sets the appropriate result code in the LI-Answer.	
Initial condition:	- Public User Identity is known - IMS Restoration procedures are not supported - Public Identity state is registered	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Public-Identity AVP indicating a registered public user identity **sends an LI-Answer** **not** containing a Server-Capabilities AVP containing a Server-Name AVP indicating the S_CSCF name containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	NOTE 1: Preamble action: Registration procedure over Cx interface. NOTE 2: An I-CSCF and S-CSCF test components need to be configured - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

TP_CX_HSS_LI_07	Standards Reference: clauses 6.1.4.1 ¶ 14 (item3-2) and tables 6.1.4.1 and 6.1.4.2	PICS item: NOT A.3/2
Summary:	Verify that the IUT checks after reception of LI-Request if Public Identity state is set as unregistered the IUT sets the appropriate result code in the LI-Answer.	
Initial condition:	- Public User Identity is known - IMS Restoration procedures are not supported - Public Identity state is unregistered	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Public-Identity AVP indicating a unregistered public user identity **sends an LI-Answer** **not** containing a Server-Capabilities AVP containing a Server-Name AVP indicating the S_CSCF name containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	NOTE: Preamble action: Registration and de-Registration procedure over Cx interface - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

TP_CX_HSS_LI_08	Standards Reference: clause 6.1.4.1 item3 (4th dash) and tables 6.1.4.1 and 6.1.4.2	PICS item: NOT A.3/2
Summary:	Verify that the IUT checks after reception of LI-Request if Public Identity state is set as not registered and S-CSCF name is assigned to a Public Identity and the IUT sets the appropriate result code in the LI-Answer.	
Initial condition:	- A user initiates an INVITE - Public User Identity is known - IMS Restoration procedures are not supported - Public Identity state is not registered - S-CSCF name assigned to a Public Identity	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Public-Identity AVP indicating a not registered public user identity containing an Originating-Request AVP **sends an LI-Answer** **not** containing a Server-Capabilities AVP containing a Server-Name AVP indicating the S_CSCF name containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	NOTE: An I-CSCF and S-CSCF test components need to be configured - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

TP_CX_HSS_LI_09	Standards Reference: clause 6.1.4.1 item3 (5th dash) and tables 6.1.4.1 and 6.1.4.2	PICS item: NOT A.3/2
Summary:	Verify that the IUT checks after reception of LI-Request if Public Identity state is set as not registered and not any S-CSCF name is assigned to a Public Identity within the IMS Subscription and the IUT sets the appropriate result code in the LI-Answer.	
Initial condition:	- Public User Identity is known - IMS Restoration procedures are not supported - Public Identity state is not registered - S-CSCF name not assigned to a Public Identity	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Public-Identity AVP indicating a not registered public identity containing an Originating-Request AVP **sends an LI-Answer** **not** containing a Server-Name AVP **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_UNREGISTERED_SERVICE.	
Comments:	NOTE: An I-CSCF and S-CSCF test components need to be configured - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

TP_CX_HSS_LI_10	Standards Reference: clauses 6.1.4.1 item3 (6th dash) and tables 6.1.4.1 and 6.1.4.2	PICS item: NOT A.3/2
Summary:	Verify that the IUT checks after reception of LI-Request if Public Identity state is set as not registered or unregistered and the IUT sets the appropriate experimental result code in the LI-Answer.	
Initial condition:	- Public User Identity is known - IMS Restoration procedures are not supported - Public Identity state is not registered - Public Identity has no terminating services related to unregistered state	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Public-Identity AVP indicating a not registered or unregistered public identity **not** containing an Originating-Request AVP **sends an LI-Answer** **not** containing a Server-Name AVP **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_IDENTITY_NOT_REGISTERED.	
Comments:	NOTE: An I-CSCF and S-CSCF test components need to be configured - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

TP_CX_HSS_LI_11	Standards Reference: clause 6.1.4.1 ¶ 19 (after item 3) and tables 6.1.4.1 and 6.1.4.2	PICS item:
Summary:	Verify that the IUT sets the appropriate result code within response in case of database error.	
Initial condition:	- A user initiates an INVITE	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Public-Identity AVP **sends an LI-Answer** **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_UNABLE_TO_COMPLY.	
Comments:	SUT Administrator Action: Simulate a database error NOTE 1: Preamble action: Registration procedure over Cx interface. NOTE 2: An I-CSCF and S-CSCF test components need to be configured - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.5.	

5.2.1.1.6 Push Profile

TP_CX_HSS_PP_01	Standards Reference: clause 6.2.1 and tables 6.2.2.1 and 6.2.2. and ETSI TS 129 229 [2] clauses 6.1.11 and 6.1.12	PICS item:
Summary:	Verify that the IUT processes all mandatory AVPs in a PP-Request due to an administrative update of a user profile.	
Initial condition:	- A user is properly registered	
Test purpose:	Ensure that the IUT **to indicate** administration user profile update **sends a PP-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Host AVP containing a Destination-Realm AVP containing a User-Name AVP (containing a User-Data AVP **and/or** containing a Charging-Information AVP **and/or** containing a SIP-Auth-Data-Item AVP).	
Comments:	NOTE 1: Preamble action: Registration procedure over Cx interface. NOTE 2: An I-CSCF and S-CSCF test components need to be configured - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.7.	

TP_CX_HSS_PP_02	Standards Reference: clause 6.2.2.1 ¶ 2 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT processes a PP-Request with a user profile containing several private user identities.	
Initial condition:	- A user with several private user identities is properly registered	
Test purpose:	Ensure that the IUT **to indicate** administration user profile update **sends a PP-Request** containing a User-Name AVP indicating one of the Private User Identities (containing a User-Data AVP **and/or** containing a Charging-Information AVP **and/or** containing a SIP-Auth-Data-Item AVP).	
Comments:	IMS UE Action: Initial registration completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.7.	

TP_CX_HSS_PP_03	Standards Reference: clause 6.2.2.1 ¶ 3 and 4 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT processes a PP-Request to update user profile information.	
Test purpose:	Ensure that the IUT **to indicate** user profile information update **sends a PP-Request** containing a User-Name AVP containing a User-Data AVP.	
Comments:	IMS UE Action: Initial registration completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.7.	

TP_CX_HSS_PP_04	Standards Reference: clause 6.2.2.1 ¶ 3 and 5 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT processes a PP-Request to update charging information.	
Test purpose:	Ensure that the IUT **to indicate** charging information update **sends a PP-Request** containing a User-Name AVP containing a Charging-Information AVP.	
Comments:	IMS UE Action: Initial registration completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.7.	

TP_CX_HSS_PP_05	Standards Reference: clause 6.2.2.1 ¶ 3 and 6 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT processes a PP-Request to update SIP Digest authentication information.	
Test purpose:	Ensure that the IUT **to indicate** SIP Digest authentication information update due to a password change **sends a PP-Request** containing a User-Name AVP containing a SIP-Auth-Data-Item AVP.	
Comments:	IMS UE Action: Initial registration completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.7.	

TP_CX_HSS_PP_06	Standards Reference: clause 6.2.2.1 ¶ 7 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT processes a PP-Request to update user profile information and if SCSCF rejects it because of not supported user data then IUT sends RT-Request with Deregistration-Reason AVP.	
Test purpose:	Ensure that the IUT **to indicate** user profile information update **sends a PP-Request** containing a User-Name AVP containing a User-Data AVP **receives a PP-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP indicating DIAMETER_ERROR_NOT_SUPPORTED_USER_DATA **sends an RT-Request** containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating SERVER_CHANGE.	
Comments:	IMS UE Action: Initial registration completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.7.	

TP_CX_HSS_PP_07	**Standards Reference: clause 6.2.2.1 ¶ 8 and tables 6.2.2.1 and 6.2.2.2**	**PICS item:**
Summary:	Verify that the IUT processes a PP-Request to update user profile information and if SCSCF rejects it because of unknown user then IUT re-sends the request using another arbitrarily selected registered private Identity(if any).	
Initial condition:	- A user with several private user identities is properly registered	
Test purpose:	Ensure that the IUT **to indicate** user profile information update **sends a PP-Request** containing a User-Name AVP indicating unknown user containing a User-Data AVP **receives a PP-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP indicating DIAMETER_ERROR_USER_UNKNOWN **sends a PP-Request** containing a User-Name AVP indicating another arbitrarily selected registered private Identity.	
Comments:	IMS UE Action: Initial registration completed - see ETSI TS 129 228 [1], clauses A.4.1 and A.4.7.	

5.2.1.1.7 Multimedia authentication

TP_CX_HSS_MA_01	**Standards Reference: clause 6.3 and tables 6.3.1, 6.3.2 and 6.3.4 and ETSI TS 129 229 [2] clauses 6.1.7 and 6.1.8**	**PICS item:**
Summary:	Verify that the IUT processes all mandatory AVPs in an MA-Request received due to S-CSCF registration notification procedure.	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Public-Identity AVP indicating one and only one public user identity containing a User-Name AVP indicating the private user identity containing a Server-Name AVP indicating S-CSCF name containing a SIP-Number-Auth-Items AVP indicating the number of authentication vectors requested containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating "SIP Digest" containing SIP-Authentication-Context indicating authentication related information **sends an MA-Answer** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a User-Name AVP indicating the private user identity containing a SIP-Number-Auth-Items AVP indicating the number of vectors delivered containing a SIP-Auth-Data-Item AVP containing SIP-Authentication-Scheme AVP indicating "SIP Digest".	
Comments:	IMS UE action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_02	**Standards Reference: clause 6.3.1 and tables 6.3.1, 6.3.2 6.3.4, 6.3.6 and 6.3.7 and ETSI TS 129 229 [2], clauses 6.1.7, 6.1.8 and IETF RFC 2617 [i.1]**	**PICS item:**
Summary:	Verify that the IUT processes all mandatory AVPs in an MA-Request received due to S-CSCF registration notification procedure based on SIP Digest authentication.	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a SIP-Number-Auth-Items AVP indicating only one set of authentication vectors containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating "SIP Digest" containing SIP-Authentication-Context AVP **sends an MA-Answer** containing a SIP-Number-Auth-Items AVP indicating only one set of authentication vectors containing a SIP-Auth-Data-Item AVP containing SIP-Authentication-Scheme AVP indicating "SIP Digest" containing SIP-Digest-Authenticate AVP containing Digest-Realm AVP indicating authentication parameter realm containing Digest-QoP AVP indicating the QoP as defined in IETF RFC 2617 [i.1] containing Digest-HA1 AVP indicating the H(A1) vector.	
Comments:	IMS UE action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_03	**Standards Reference: clause 6.3.1 and tables 6.3.1, 6.3.2, 6.3.3, 6.3.4 and 6.35 and ETSI TS 129 229 [2], clauses 6.1.7 and 6.1.8 and ETSI TS 133 203 [i.2]**	**PICS item:**
Summary:	Verify that the IUT processes all mandatory AVPs in an MA-Request received due to S-CSCF registration notification procedure based on IMS-AKA authentication.	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a SIP-Number-Auth-Items AVP indicating the number of authentication vectors requested containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating "Digest-AKAv1-MD5" **not** containing SIP-Authentication-Context AVP containing SIP-Authorization AVP containing concatenation of RAND and AUTS **sends an MA-Answer** containing a SIP-Number-Auth-Items AVP indicating a set of authentication vectors containing a SIP-Auth-Data-Item AVP containing SIP-Authentication-Scheme AVP indicating "Digest-AKAv1-MD5" containing SIP-Authenticate AVP indicating the tokens RAND + AUTS containing SIP-Authorization AVP indicating the expected response XRES containing Integrity-Key AVP indicating the integrity key.	
Comments:	IMS UE action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_04	**Standards Reference:** **clause 6.3.1 and tables 6.3.1, 6.3.2, 6.3.4 and 6.3.8 and ETSI TS 129 229 [2], clauses 6.1.7 and 6.1.8**	**PICS item:**
Summary:	Verify that the IUT processes all mandatory AVPs in an MA-Request received due to S-CSCF registration notification procedure based on NASS-Bundled authentication.	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a SIP-Number-Auth-Items AVP indicating the number of authentication vectors requested containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating "NASS-Bundled" **sends an MA-Answer** containing a SIP-Number-Auth-Items AVP indicating only one set of authentication vectors containing a SIP-Auth-Data-Item AVP containing SIP-Authentication-Scheme AVP indicating "NASS-Bundled" containing Line-Identifier AVP indicating the broadband access line identifier associated to the user.	
Comments:	IMS UE action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_05	**Standards Reference:** **clause 6.3.1 and tables 6.3.1, 6.3.2, 6.3.4 and 6.3.9 and ETSI TS 129 229 [2], clauses 6.1.7 and 6.1.8 and IETF RFC 4005 [i.3]**	**PICS item:**
Summary:	Verify that the IUT processes all mandatory AVPs in an MA-Request received due to S-CSCF registration notification procedure based on GIBA authentication (GPRS-IMS-Bundled).	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a SIP-Number-Auth-Items AVP indicating the number of authentication vectors requested containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating "Early-IMS-Security" **sends an MA-Answer** containing a SIP-Number-Auth-Items AVP indicating only one set of authentication vectors containing a SIP-Auth-Data-Item AVP containing SIP-Authentication-Scheme AVP indicating "Early-IMS-Security" containing Frame-IP-Address AVP.	
Comments:	IMS UE action: Registration - see ETSI TS 129 228 [1], clause A.4.1. In the case of IPv6 the Framed-IP-Address AVP is replaced by the Framed-IPv6-Prefix AVP.	

TP_CX_HSS_MA_06	Standards Reference: clause 6.3.1 ¶ 2 (item 1) and tables 6.3.1 6.3.2 and 6.3.4	PICS item:
Summary:	Verify that the IUT processes an MA-Request containing an invalid Public/Private user identity.	
Initial condition:	- Public Identity exists in IUT - Private Identity does not exist in IUT	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a Public-Identity AVP indicating a known public user identity, containing a User-Name AVP indicating an unknown private user identity **sends an MA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_USER_UNKNOWN.	
Comments:	IMS UE action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_07	Standards Reference: clause 6.3.1 item 2 and tables 6.3.1, 6.3.2 and 6.3.4	PICS item:
Summary:	Verify that the IUT processes an MA-Request containing a mismatch between the Public and the Private user identity.	
Initial condition:	- Public and Private Identities exist in IUT - Public User Identity does not match a distinct Public User Identity in IUT	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a Public-Identity AVP indicating a known public user identity containing a User-Name AVP indicating an unknown private user identity **sends an MA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_USER_UNKNOWN.	
Comments:	IMS UE action: Registration with an unknown authentication scheme - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_08	Standards Reference: clause 6.3.1 item 3 and tables 6.3.1, 6.3.2 and 6.3.4	PICS item:
Summary:	Verify that the IUT checks that the Public Identity received in the request is associated with the Private Identity received in the request and if not the IUT sets the appropriate experimental result code in the MA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is not associated to Private User Identity in IUT	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a Public-Identity AVP indicating an unassociated private user identity (not belonging to the public user identity) containing a User-Name AVP indicating a known private user identity **sends an MA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_IDENTITIES_DONT_MATCH.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_09	**Standards Reference: clause 6.3.1 ¶ 6 item 4 (1st dash) and tables 6.3.1, 6.3.2 and 6.3.4**	**PICS item:**
Summary:	Verify that the IUT checks authentication scheme in the request and if it is "Unknown" and it is neither NASS-Bundled authentication nor SIP digest authentication the IUT sets the appropriate experimental result code in the MA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - NASS and SIP Digest authentication schemes are not stored in the IUT	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme indicating "Unknown" authentication scheme **sends an MA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_AUTH_SCHEME_UNSUPPORTED.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_10	**Standards Reference: clause 6.3.1 item 4 (2nd dash) and tables 6.3.1, 6.3.2 and 6.3.4**	**PICS item:**
Summary:	Verify that the IUT checks if authentication scheme is supported.	
Initial condition:	- The requested authentication scheme is not supported by the IUT	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating an unsupported authentication scheme **sends an MA-Answer** **not** containing a Result-Code AVP containing an Experimental-Result AVP containing an Experimental-Result-Code AVP indicating DIAMETER_ERROR_AUTH_SCHEME_UNSUPPORTED.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_11	**Standards Reference: clause 6.3.1 item 4 (3rd dash) and table 6.3.1**	**PICS item:**
Summary:	Verify that the IUT checks authentication scheme in the request and if it is synchronization failure for IMS-AKA and S-CSCF name from the request is the same as stored in the IUT the IUT sets the appropriate result code in the MA-Answer.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - Authentication schema in the request is supported	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a User-Name AVP indicating a known private user identity containing a Public-Identity AVP containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating value "Digest-AKAv1-MD5" containing a SIP-Authorization AVP containing concatenation of RAND and AUTS **not** containing a SIP-Authentication-Context AVP **sends an MA-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	IMS UE Action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_MA_12	**Standards Reference: clause 6.3.1 ¶ 17 (after item 5) and tables 6.3.1, 6.3.2 and 6.3.4 and ETSI TS 133 203 [i.2]**	**PICS item:**
Summary:	Verify that the IUT checks for synchronization failures.	
Initial condition:	- Private and Public User Identity exist in IUT - Public User Identity matches a distinct Public User Identity in IUT - Public User Identity received in Request is associated to Private User Identity in IUT - The sequence numbers in the UE and the IUR for IMS-AKA authentication schemes are not synchronized	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a SIP-Number-Auth-Items AVP indicating the number of authentication vectors requested containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme indicating "Digest-AKAv1-MD5" **not** containing SIP-Authentication-Context AVP containing SIP-Authorization AVP containing concatenation of RAND and AUTS **sends an MA-Answer** containing a Result-Code AVP indicating DIAMETER_UNABLE_TO_COMPLY **not** containing an Experimental-Result AVP.	
Comments:	IMS UE action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

5.2.1.1.8 Error Handling

TP_CX_HSS_ER_01	Standards Reference: clauses 6.3 and 8.1 ¶ 1	PICS item:
Summary:	Verify that the IUT in case of registration error cases returns the appropriate response.	
Initial condition:	- The user profile indicates an attached S-CSCF name	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a Server-Name AVP indicating an S-CSCF name different than the previous one containing a SIP-Number-Auth-Items AVP indicating the number of authentication vectors requested containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme indicating "Digest-AKAv1-MD5" **not** containing SIP-Authentication-Context AVP **sends an MA-Answer** containing a Server-Name AVP indicating the new S-CSCF name containing a SIP-Number-Auth-Items AVP indicating a set of authentication vectors containing a SIP-Auth-Data-Item AVP containing SIP-Authentication-Scheme AVP indicating "Digest-AKAv1-MD5" containing SIP-Authenticate AVP containing AUTS parameter containing SIP-Authorization AVP indicating the expected response XRES containing Integrity-Key AVP indicating the integrity key containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP.	
Comments:	IMS UE action: Registration - see ETSI TS 129 228 [1], clause A.4.1.	

TP_CX_HSS_ER_02	Standards Reference: clause 8.1.1	PICS item: A.3/2
Summary:	Verify that the IUT on receipt of an MA-Request including a new S-CSCF name, which is not the same as the previously assigned S-CSCF and IMS Restoration Procedure is supported than IUT sends the appropriate RT-Request to the old S-CSCF.	
Initial condition:	- The user is successfully registered - The current S-CSCF is stopped - The user is also registered on the new S-CSCF - Initiate a Re-registration procedure	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request from new S-CSCF** containing a Server-Name AVP indicating the S-CSCF name **sends an RT-Request to old S-CSCF** containing a Destination-Host AVP indicating the previous S-CSCF name containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating NEW_SERVER_ASSIGNED **sends an MA-Answer to new S_CSCF** containing a Server-Name AVP indicating the new S-CSCF name.	
Comments:		

TP_CX_HSS_ER_03	Standards Reference: clause 8.1.1	PICS item: NOT A.3/2
Summary:	Verify that the IUT on receipt of an MA-Request including a new S-CSCF name, which is not the same as the previously assigned S-CSCF and IMS Restoration Procedure is not supported than IUT sends the appropriate RT-Request to the old S-CSCF.	
Initial condition:	- The user is successfully registered - The current S-CSCF is stopped - The user is also registered on the new S-CSCF - Initiate a Re-registration procedure	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request from new S-CSCF** containing a Server-Name AVP indicating the S-CSCF name **sends an RT-Request to old S-CSCF** containing a Server-Name AVP indicating the previous S-CSCF name containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating NEW_SERVER_ASSIGNED **sends an RT-Request to old S-CSCF** containing a Destination-Host AVP indicating the new S-CSCF name containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating SERVER_CHANGE **sends an MA-Answer to new S-CSCF** containing a Server-Name AVP indicating the new S-CSCF name.	
Comments:		

5.2.1.2 CSCF Role

5.2.1.2.0 Test Selection

IUT takes the role of the CSCF; PICS A.2/2 and applicable test configuration is CF_1Cx1Gm.

5.2.1.2.1 Message Syntax

TP_CX_CSCF_MS_01	Standards Reference: clause 6 ¶ 2	PICS item:
Summary:	Verify that the IUT sends the appropriate Result-Code AVP in case when mandatory Information Element is absent.	
Test purpose:	Ensure that the IUT **on receipt of an RT-Request** containing a Session-ID AVP **not** containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Host AVP containing a Destination-Realm AVP containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating the de-registration code **sends an RT-Answer** containing a Result-Code AVP indicating DIAMETER_MISSING_AVP containing a Failed AVP indicating missing Vendor-Specific-Application-Id AVP.	
Comments:		

5.2.1.2.2 User Authorization

Test Selection: IUT takes the role of the CSCF; PICS A.2/2.1

TP_CX_CSCF_UA_01	Standards Reference: table 6.1.1.1 and ETSI TS 129 229 [2], clause 6.1.1	PICS item:
Summary:	Verify that the IUT sends UA-Request for user registration.	
Test purpose:	Ensure that the IUT **to indicate** a request for user registration, **sends a UA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating the public user identity to be registered containing a Visited-Network-Identifier AVP indicating the domain name of the visited network containing a User-Authorization-Type AVP indicating REGISTRATION containing a User-Name AVP indicating the private user identity containing a Destination-Realm AVP containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set.	
Comments:		

TP_CX_CSCF_UA_02	Standards Reference: table 6.1.1.1 and ETSI TS 129 229 [2], clause 6.1.1	PICS item:
Summary:	Verify that the IUT sends UA-Request for user re-registration.	
Test purpose:	Ensure that the IUT **to indicate** a request for user registration, **sends a UA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating the public user identity to be registered containing a Visited-Network-Identifier AVP indicating the domain name of the visited network containing a User-Authorization-Type AVP indicating REGISTRATION containing a User-Name AVP indicating the private user identity containing a Destination-Realm AVP containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set.	
Comments:		

TP_CX_CSCF_UA_03	Standards Reference: table 6.1.1.1 and ETSI TS 129 229 [2], clause 6.1.1	PICS item:
Summary:	Verify that the IUT sends UA-Request for user deregistration.	
Test purpose:	Ensure that the IUT **to indicate** a request for user deregistration, **sends a UA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating the public user identity to be registered containing a Visited-Network-Identifier AVP indicating the domain name of the visited network containing a User-Authorization-Type AVP indicating DE-REGISTRATION containing a User-Name AVP indicating the private user identity containing a Destination-Realm AVP containing a UAR-Flags AVP with IMS-Emergency-Registration bit not set.	
Comments:		

TP_CX_CSCF_UA_04	Standards Reference: table 6.1.1.1 and ETSI TS 129 229 [2], clause 6.1.1	PICS item: A.4/4
Summary:	Verify that the IUT sends UA-Request for IMS Emergency Registration.	
Test purpose:	Ensure that the IUT **to indicate** a request with IMS Emergency Registration, **sends a UA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating the public user identity containing a Visited-Network-Identifier AVP indicating the domain name of the visited network containing a User-Name AVP indicating the private user identity containing a Destination-Realm AVP containing a UAR-Flags AVP with IMS-Emergency-Registration bit set.	
Comments:		

5.2.1.2.3 Server assignment

Test Selection: IUT takes the role of the CSCF; PICS A.2/2.2

TP_CX_CSCF_SA_01	Standards Reference: table 6.1.2.1 and clause A.4.1 and ETSI TS 129 229 [2], clause 6.1.3	PICS item:
Summary:	Verify that the IUT sends SA-Request for server registration notification.	
Test purpose:	Ensure that the IUT **to indicate** a request for server registration notification, **sends an SA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating one and only one public user identity **not** containing a User-Name AVP containing a Destination-Realm AVP containing a Server-Name AVP indicating S-CSCF name containing a Server-Assignment-Type AVP indicating REGISTRATION containing a User-Data-Already-Available AVP.	
Comments:		

TP_CX_CSCF_SA_02	Standards Reference: table 6.1.2.1 and clause A.4.2 and ETSI TS 129 229 [2], clause 6.1.3	PICS item:
Summary:	Verify that the IUT sends SA-Request for re-registration.	
Test purpose:	Ensure that the IUT **to indicate** a request for re-registration, **sends an SA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating one and only one public user identity **not** containing a User-Name AVP containing a Destination-Realm AVP containing a Server-Name AVP indicating S-CSCF name containing a Server-Assignment-Type AVP indicating RE-REGISTRATION containing a User-Data-Already-Available AVP.	
Comments:		

TP_CX_CSCF_SA_03	Standards Reference: table 6.1.2.1 and clause A.4.3 and ETSI TS 129 229 [2], clause 6.1.3	PICS item:
Summary:	Verify that the IUT sends SA-Request for deregistration notification.	
Test purpose:	Ensure that the IUT **to indicate** a request for de-registration notification, **sends an SA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating one and only one public user identity **not** containing a User-Name AVP containing a Destination-Realm AVP containing a Server-Name AVP indicating S-CSCF name containing a Server-Assignment-Type AVP indicating USER_DEREGISTRATION containing a User-Data-Already-Available AVP.	
Comments:		

TP_CX_CSCF_SA_04	Standards Reference: table 6.1.2.1 and clause A.4.4.1 and ETSI TS 129 229 [2], clause 6.1.3	PICS item:
Summary:	Verify that the IUT sends SA-Request for timeout deregistration.	
Test purpose:	Ensure that the IUT **to indicate** a request for timeout deregistration, **sends an SA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating one and only one public user identity **not** containing a User-Name AVP containing a Destination-Realm AVP containing a Server-Name AVP indicating S-CSCF name containing a Server-Assignment-Type AVP indicating TIMEOUT_DEREGISTRATION containing a User-Data-Already-Available AVP.	
Comments:		

5.2.1.2.4 Registration Termination

Test Selection: IUT takes the role of the CSCF; PICS A.2/2.2

TP_CX_CSCF_RT_01	Standards Reference: clause 6.1.3 and tables 6.1.3.1 and 6.1.3.2	PICS item:
Summary:	Verify that the IUT processes all mandatory AVPs in an RT-Request received due to network initiated de-registration by the HSS and IUT returns RT-Answer with all mandatory AVP's and with the appropriate result code.	
Initial condition:		
Test purpose:	Ensure that the IUT **on receipt of an RT-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Host AVP containing a Destination-Realm AVP containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating one of deregistration reasons **sends an RT-Answer** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Result-Code AVP.	
Comments:	IMS UE Action: Initiate a registration.	

TP_CX_CSCF_RT_02	Standards Reference: clause 6.1.3.1 ¶ 1 and 16th dash and tables 6.1.3.1 and 6.1.3.2	PICS item:
Summary:	Verify that the IUT rejects de-registration of emergency Public Identities.	
Initial condition:	- A user is properly registered with Emergency option set	
Test purpose:	Ensure that the IUT **on receipt of an RT-Request** containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating PERMANENT_TERMINATION **sends an RT-Answer** containing an Identity-with-Emergency-Registration AVP indicating a list of Private/public Identity pair **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_UNABLE_TO_COMPLY.	
Comments:	IMS UE Action: Initiate a registration including Emergency option completed.	

TP_CX_CSCF_RT_03	Standards Reference: clause 6.1.3 ¶ 1 and 17th dash and tables 6.1.3.1 and 6.1.3.2	PICS item:
Summary:	Verify that the IUT rejects de-registration of emergency Public Identities.	
Initial condition:	- A user is properly registered with Emergency option set	
Test purpose:	Ensure that the IUT **on receipt of an RT-Request** containing a User-Name AVP indicating the private user identity containing a Deregistration-Reason AVP containing a Reason-Code AVP indicating REMOVE_S-CSCF containing a Destination-Host AVP indicating the name of the S-CSCF which originated the last update **receives an RT-Answer** containing an Identity-with-Emergency-Registration AVP indicating a list a of Private/public Identity pair **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_LIMITED_SUCCESS.	
Comments:	IMS UE Action: Initiate a registration including Emergency option completed.	

5.2.1.2.5 Location Information

Test Selection: IUT takes the role of the CSCF; PICS A.2/2.1

TP_CX_CSCF_LI_01	Standards Reference: table 6.1.4.1 and ETSI TS 129 229 [2] clause 6.1.5	PICS item:
Summary:	Verify that the IUT sends LI-Request for user location query.	
Test purpose:	Ensure that the IUT **to indicate** a request for user location query, **sends a LI-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Public-Identity AVP.	
Comments:		

5.2.1.2.6 Push Profile

Test Selection: IUT takes the role of the CSCF; PICS A.2/2.2

TP_CX_CSCF_PP_01	Standards Reference: clauses 6.2.2 and 6.2.2.1 ¶ 4 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT when receiving PP-Request to update user profile information the IUT returns PP-Answer with all mandatory AVP's and with the appropriate result code.	
Initial condition:		
Test purpose:	Ensure that the IUT **on receipt of a PP-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Host AVP containing a Destination-Realm AVP containing a User-Name AVP containing a User-Data AVP **sends a PP-Answer** containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS.	
Comments:	IMS UE Action: Initiate a registration.	

TP_CX_CSCF_PP_02	Standards Reference: clauses 6.2.2 and 6.2.2.1 ¶ 4 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT when receiving PP-Request to update charging information the IUT returns PP-Answer with the appropriate result code.	
Initial condition:		
Test purpose:	Ensure that the IUT **on receipt of a PP-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Host AVP containing a Destination-Realm AVP containing a User-Name AVP containing a Charging-Information AVP **sends a PP-Answer** **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS.	
Comments:	IMS UE Action: Initiate a registration.	

TP_CX_CSCF_PP_03	Standards Reference: clauses 6.2.2 and 6.2.2.1 ¶ 4 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT when receiving PP-Request to update SIP Digest authentication information the IUT returns PP-Answer with the appropriate result code.	
Initial condition:		
Test purpose:	Ensure that the IUT **on receipt of a PP-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Host AVP containing a Destination-Realm AVP containing a User-Name AVP containing a SIP-Auth-Data-Item AVP **sends a PP-Answer** **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS.	
Comments:	IMS UE Action: Initiate a registration.	

TP_CX_CSCF_PP_04	Standards Reference: clauses 6.2.2 and 6.2.2.1 ¶ 4 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT when receiving PP-Request to update user profile information with not supported user data the IUT returns PP-Answer with the appropriate result code.	
Initial condition:		
Test purpose:	Ensure that the IUT **on receipt of a PP-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Host AVP containing a Destination-Realm AVP containing a User-Name AVP containing a User-Data AVP indicating not supported user data **sends a PP-Answer** **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_ERROR_NOT_SUPPORTED_USER_DATA.	
Comments:	IMS UE Action: Initiate a registration.	

TP_CX_CSCF_PP_05	Standards Reference: clauses 6.2.2 and 6.2.2.1 ¶ 4 and tables 6.2.2.1 and 6.2.2.2	PICS item:
Summary:	Verify that the IUT when receiving PP-Request to update user profile information with unknown user the IUT returns PP-Answer with the appropriate result code.	
Initial condition:		
Test purpose:	Ensure that the IUT **on receipt of a PP-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Host AVP containing a Destination-Realm AVP containing a User-Name AVP indicating unknown user containing a User-Data AVP **sends a PP-Answer** **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_ERROR_USER_UNKNOWN.	
Comments:	IMS UE Action: Initiate a registration.	

5.2.1.2.7 Multimedia Authentication

Test Selection: IUT takes the role of the CSCF; PICS A.2/2.2

TP_CX_CSCF_MA_01	Standards Reference: tables 6.3.1 and 6.3.2 and clause A.4.1 and ETSI TS 129 229 [2], clause 6.1.7	PICS item:
Summary:	Verify that the IUT sends MA-Request for "SIP Digest" authentication procedure.	
Test purpose:	Ensure that the IUT **to indicate** a request for "SIP Digest" authentication procedure, **sends an MA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating public user identity containing a User-Name AVP indicating private user identity containing a Destination-Realm AVP containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating value "SIP Digest" containing a SIP-Number-Auth-Items AVP containing a Server-Name AVP indicating S-CSCF name.	
Comments:		

TP_CX_CSCF_MA_02	Standards Reference: tables 6.3.1 and 6.3.2 and clause A.4.1 and ETSI TS 129 229 [2], clause 6.1.7	PICS item: A.6/16
Summary:	Verify that the IUT sends MA-Request for "Digest-AKAv1-MD5" authentication procedure.	
Test purpose:	Ensure that the IUT **to indicate** a request for "Digest-AKAv1-MD5" authentication procedure, **sends an MA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating public user identity containing a User-Name AVP indicating private user identity containing a Destination-Realm AVP containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating value "Digest-AKAv1-MD5" **not** containing a SIP-Authentication-Context AVP containing a SIP-Number-Auth-Items AVP containing a Server-Name AVP indicating S-CSCF name.	
Comments:		

TP_CX_CSCF_MA_03	Standards Reference: tables 6.3.1, 6.3.2 and 6.3.3 and clause A.4.1 and ETSI TS 129 229 [2], clause 6.1.7	PICS item:
Summary:	Verify that the IUT sends MA-Request for "Digest-AKAv1-MD5" authentication procedure with synchronization failure.	
Test purpose:	Ensure that the IUT **to indicate** a request for "Digest-AKAv1-MD5" authentication procedure with synchronization failure, **sends an MA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating public user identity containing a User-Name AVP indicating private user identity containing a Destination-Realm AVP containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating value "Digest-AKAv1-MD5" containing concatenation of RAND and AUTS containing a SIP-Authorization AVP containing concatenation of RAND and AUTS **not** containing a SIP-Authentication-Context AVP containing a SIP-Number-Auth-Items AVP containing a Server-Name AVP indicating S-CSCF name.	
Comments:		

TP_CX_CSCF_MA_04	Standards Reference: tables 6.3.1 and 6.3.2 and clause A.4.1 and ETSI TS 129 229 [2], clause 6.1.7	PICS item:
Summary:	Verify that the IUT sends MA-Request for "NASS-Bundled" authentication procedure.	
Test purpose:	Ensure that the IUT **to indicate** a request for "NASS-Bundled" authentication procedure, **sends an MA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating public user identity containing a User-Name AVP indicating private user identity containing a Destination-Realm AVP containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating value "NASS-Bundled" containing a SIP-Number-Auth-Items AVP containing a Server-Name AVP indicating S-CSCF name.	
Comments:		

TP_CX_CSCF_MA_05	Standards Reference: tables 6.3.1 and 6.3.2 and clause A.4.1 and ETSI TS 129 229 [2], clause 6.1.7	PICS item:
Summary:	Verify that the IUT sends MA-Request for "Early-IMS-Security" authentication procedure.	
Test purpose:	Ensure that the IUT **to indicate** a request for "Early-IMS-Security" authentication procedure, **sends an MA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating public user identity containing a User-Name AVP indicating private user identity containing a Destination-Realm AVP containing a SIP-Auth-Data-Item AVP containing a SIP-Authentication-Scheme AVP indicating value "Early-IMS-Security" containing a SIP-Number-Auth-Items AVP containing a Server-Name AVP indicating S-CSCF name.	
Comments:		

5.2.2 Dx Interface

5.2.2.1 SLF Role

5.2.2.1.0 Test Selection

IUT takes the role of the CSCF; PICS A.7/1 and applicable test configuration is CF_1Dx.

5.2.2.1.1 User Authorization

TP_DX_SLF_UA_01	**Standards Reference: clause 6.1.1 and tables 6.1.1.1 and 6.1.1.2 and ETSI TS 129 229 [2], clauses 5.5 ¶ 3, 6.1.1 and 6.1.2**	**PICS item:**
Summary:	Verify that the IUT processes a UA-Request and sends corresponding UA-Answer.	
Test purpose:	Ensure that the IUT **on receipt of a UA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating the public user identity to be registered containing a Visited-Network-Identifier AVP indicating the domain name of the visited network containing a User-Name AVP indicating the private user identity containing a Destination-Realm AVP **sends a UA-Answer** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing an Redirect-HOST AVP indicating the HSS identity to be used **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_REDIRECT_INDICATION (3006).	
Comments:		

5.2.2.1.2 Server assignment

TP_DX_SLF_SA_01	**Standards Reference: clause 6.1.2 and tables 6.1.2.1 and 6.1.2.2 and ETSI TS 129 229 [2], clauses 5.5 ¶ 3, 6.1.3 and 6.1.4**	**PICS item:**
Summary:	Verify that the IUT processes an SA-Request and sends corresponding SA-Answer.	
Test purpose:	Ensure that the IUT **on receipt of an SA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating one and only one public user identity **not** containing a User-Name AVP containing a Destination-Realm AVP containing a Server-Name AVP indicating S-CSCF name containing a Server-Assignment-Type AVP indicating UNREGISTERED_USER containing a User-Data-Already-Available AVP **sends an SA-Answer** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing an Redirect-HOST AVP indicating the HSS identity to be used **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_REDIRECT_INDICATION (3006).	
Comments:		

5.2.2.1.3 Location Information

TP_DX_SLF_LI_01	**Standards Reference: clause 6.1.4 ¶ 1 and tables 6.1.4.1 and 6.1.4.2 and ETSI TS 129 229 [2], clauses 5.5 ¶ 3, 6.1.5 and 6.1.6**	**PICS item:**
Summary:	Verify that the IUT processes an LI-Request and sends corresponding LI-Answer.	
Initial condition:	- A user initiates an INVITE	
Test purpose:	Ensure that the IUT **on receipt of an LI-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Public-Identity AVP **sends an LI-Answer** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Redirect-Host AVP indicating the HSS identity to be used **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_REDIRECT_INDICATION (3006).	
Comments:	IMS UE Action: Initiate an INVITE NOTE: An I-CSCF need to be configured.	

5.2.2.1.4 Multimedia authentication

TP_DX_SLF_MA_01	**Standards Reference: clause 6.3 and tables 6.3.1 and 6.3.4 and ETSI TS 129 229 [2], clauses 5.5 ¶ 3, 6.1.7 and 6.1.8**	**PICS item:**
Summary:	Verify that the IUT processes an MA-Request and sends corresponding MA-Answer.	
Test purpose:	Ensure that the IUT **on receipt of an MA-Request** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP indicating NO_STATE_MAINTAINED containing an Origin-Host AVP containing an Origin-Realm AVP containing a Public-Identity AVP indicating one and only one public user identity **not** containing a User-Name AVP containing a Destination-Realm AVP containing a Server-Name AVP indicating S-CSCF name containing a SIP-Number-Auth-Items AVP indicating the number of authentication vectors requested containing a SIP-Auth-Data-Item AVP indicating the authentication scheme requested **sends an MA-Answer** containing a Session-ID AVP containing a Vendor-Specific-Application-Id AVP containing an Auth-Session-State AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing an Redirect-Host AVP indicating the HSS identity to be used **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_REDIRECT_INDICATION (3006).	
Comments:		

5.2.2.2 CSCF Role

5.2.2.2.0 Test Selection

IUT takes the role of the CSCF; PICS A.7/2 and applicable test configuration is CF_1Dx1Cx1Gm.

The CSCFs shall be configured with the address/name of the SLF.

5.2.2.2.1 User Authorization

TP_DX_CSCF_UA_01	Standards Reference: table 6.1.1.1 and ETSI TS 129 229 [2], clauses 5.5 ¶ 3 and 6.1.1	PICS item:
Summary:	Verify that the IUT after initial registration sends a UA-Request to the SLF and after reception of a UA-Answer forwards a UA-Request to the HSS.	
Test purpose:	Ensure that the IUT **to indicate** a request for user registration, **sends a UA-Request** to the **SLF** **on receipt of a UA-Answer** from the **SLF** containing a Redirect-Host AVP indicating the HSS identity to be used **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_REDIRECT_INDICATION (3006) **sends** a **UA-Request** to the **HSS** containing a Destination-Host AVP containing a Destination-Realm AVP.	
Comments:	NOTE: IMS UE Action: Initial registration.	

5.2.2.2.2 Server assignment

TP_DX_CSCF_SA_01	Standards Reference: table 6.1.2.1 and clause A.4.1 and ETSI TS 129 229 [2], clauses 5.5 ¶ 3 and 6.1.3	PICS item:
Summary:	Verify that the IUT after server registration notification sends an SA-Request to the SLF and after reception of an SA-Answer forwards an SA-Request to the HSS.	
Test purpose:	Ensure that the IUT **to indicate** a request for server registration notification, **sends an SA-Request to the SLF** **on receipt of a SA-Answer** from the **SLF** containing a Redirect-Host AVP indicating the HSS identity to be used **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_REDIRECT_INDICATION (3006) **sends** a **SA-Request** to the **HSS** containing a Destination-Host AVP containing a Destination-Realm AVP.	
Comments:		

5.2.2.2.3 Location Information

TP_DX_CSCF_LI_01	Standards Reference: table 6.1.4.1 and ETSI TS 129 229 [2], clauses 5.5 ¶ 3 and 6.1.5	PICS item:
Summary:	Verify that the IUT after a user location request sends an LI-Request to the SLF and after reception of an LI-Answer forwards an LI-Request to the HSS.	
Test purpose:	Ensure that the IUT **to indicate** a request for user location query, **sends a LI-Request** **on receipt of a LI-Answer** from the **SLF** containing a Redirect-Host AVP indicating the HSS identity to be used **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_REDIRECT_INDICATION (3006) **sends** a **LI-Request** to the **HSS** containing a Destination-Host AVP containing a Destination-Realm AVP.	
Comments:		

5.2.2.2.4 Multimedia authentication

TP_DX_CSCF_MA_01	**Standards Reference: clause 6.3 and tables 6.3.1 and 6.3.4 and ETSI TS 129 229 [2], clauses 5.5 ¶ 3, 6.1.7 and 6.1.8**	**PICS item:**
Summary:	Verify that the IUT after multimedia authentication notification sends an MA-Request to the SLF and after reception of an MA-Answer forwards an MA-Request to the HSS.	
Test purpose:	Ensure that the IUT **to indicate** a request for server registration notification, **sends an MA-Request to the SLF** **on receipt of a MA-Answer** from the **SLF** containing a Redirect-Host AVP indicating the HSS identity to be used **not** containing an Experimental-Result AVP containing a Result-Code AVP indicating DIAMETER_REDIRECT_INDICATION (3006) **sends** a **MA-Request** to the **HSS** containing a Destination-Host AVP containing a Destination-Realm AVP.	
Comments:		

History

Document history		
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V2.1.1	July 2016	Publication